

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (Previously Presented) A polyisocyanate composition with a high mean functionality, obtained by polycondensation of diisocyanate or triisocyanate monomers, comprising:

(a) from 0.5% to 30% by mass, relative to the total mass of the components a), b) and c), of compounds bearing a single uretidinedione functional group having a molecular mass of not more than twice the average molecular mass of the isocyanate monomers having the highest molecular mass;

(b) from 0.5% to 45% by mass, relative to the total mass of the components a), b) and c), of compounds bearing a single isocyanurate functional group with a molecular mass of not more than three times the average molecular mass of said isocyanate monomers having the highest molecular mass;
the molar ratio of (a)/(b) being between 0.02 and 2,

(c) at least 40% by mass, relative to the total mass of the components a), b) and c), of a mixture of polyisocyanate compounds having a molecular mass at least equal to three times the average molecular mass of the isocyanate monomers having the smallest molecular mass and bearing at least two isocyanate functional groups, and
said mixture comprising

(i) compounds bearing at least two isocyanurate functional groups, excluding those comprising uretidinedione functions,

(ii) compounds bearing at least two uretidinedione functional groups, excluding those comprising isocyanurate functions and for which the number of monomer units is less than 5,

(iii) compounds bearing at least one isocyanurate functional group and at least one uretidinedione functional group, having a molecular mass greater than three times the highest molecular mass of the above isocyanate monomer compounds;

said mixture having a ratio: carbonyl functional groups belonging to a uretidinedione ring/carbonyl functional groups belonging to an isocyanurate ring + carbonyl functional groups belonging to a uretidinedione ring, at least equal to 4%;

d) from 0 to 25% by mass, relative to the mass of the components a), b), c), d) and e), of compounds bearing at least one isocyanate functional group that are different than a), b) and c); and

e) from 0 to 10% by mass, relative to the mass of the components a), b), c), d) and e), of impurities;

said polyisocyanate composition having a functionality of greater than 3.

2. (Currently Amended) ~~The A~~ polyisocyanate composition ~~as claimed in claim 1,~~ with a high mean functionality, obtained by polycondensation of diisocyanate or triisocyanate monomers, comprising:

(a) from 0.5% to 30% by mass, relative to the total mass of the components a), b) and c), of compounds bearing a single uretidinedione functional group having a

molecular mass of not more than twice the average molecular mass of the isocyanate monomers having the highest molecular mass;

(b) from 0.5% to 45% by mass, relative to the total mass of the components a), b) and c), of compounds bearing a single isocyanurate functional group with a molecular mass of not more than three times the average molecular mass of said isocyanate monomers having the highest molecular mass;

the molar ratio of (a)/(b) being between 0.02 and 2,

(c) at least 40% by mass, relative to the total mass of the components a), b) and c), of a mixture of polyisocyanate compounds having a molecular mass at least equal to three times the average molecular mass of the isocyanate monomers having the smallest molecular mass and bearing at least two isocyanate functional groups, and
said mixture comprising

(i) compounds bearing at least two isocyanurate functional groups, excluding those comprising uretidinedione functions,

(ii) compounds bearing at least two uretidinedione functional groups, excluding those comprising isocyanurate functions and for which the number of monomer units is less than 5,

(iii) compounds bearing at least one isocyanurate functional group and at least one uretidinedione functional group, having a molecular mass greater than three times the highest molecular mass of the above isocyanate monomer compounds;

said mixture having a ratio: carbonyl functional groups belonging to a uretidinedione ring/carbonyl functional groups belonging to an isocyanurate ring + carbonyl functional groups belonging to a uretidinedione ring, at least equal to 4%;

d) from 0 to 25% by mass, relative to the mass of the components a), b), c), d) and e), of compounds bearing at least one isocyanate functional group that are different than a), b) and c); and

e) from 0 to 10% by mass, relative to the mass of the components a), b), c), d) and e), of impurities;

said polyisocyanate composition having a functionality of greater than 3.5.

3. (Previously Presented) The polyisocyanate composition as claimed in claim 1, comprising from 1% to 30% by mass of the component (a) relative to the total mass of the components a) + b) + c).

4. (Previously Presented) The polyisocyanate composition as claimed in claim 1, comprising from 5% to 40% by mass of the component (b) relative to the total mass of the components a) + b) + c).

5. (Previously Presented) The polyisocyanate composition as claimed in claim 1, wherein the component c) represents at least 45% by mass relative to the total mass of the components a) + b) + c).

6. (Currently Amended) The A polyisocyanate composition as-claimed-in claim-4 with a high mean functionality, obtained by polycondensation of diisocyanate or triisocyanate monomers, comprising:

(a) from 0.5% to 30% by mass, relative to the total mass of the components a), b) and c), of compounds bearing a single uretidinedione functional group having a molecular mass of not more than twice the average molecular mass of the isocyanate monomers having the highest molecular mass;

(b) from 0.5% to 45% by mass, relative to the total mass of the components a), b) and c), of compounds bearing a single isocyanurate functional group with a molecular mass of not more than three times the average molecular mass of said isocyanate monomers having the highest molecular mass;

the molar ratio of (a)/(b) being between 0.02 and 2,

(c) at least 40% by mass, relative to the total mass of the components a), b) and c), of a mixture of polyisocyanate compounds having a molecular mass at least equal to three times the average molecular mass of the isocyanate monomers having the smallest molecular mass and bearing at least two isocyanate functional groups, and
said mixture comprising

(i) compounds bearing at least two isocyanurate functional groups, excluding those comprising uretidinedione functions,

(ii) compounds bearing at least two uretidinedione functional groups, excluding those comprising isocyanurate functions and for which the number of monomer units is less than 5,

(iii) compounds bearing at least one isocyanurate functional group and at least one uretidinedione functional group, having a molecular mass greater than three times the highest molecular mass of the above isocyanate monomer compounds;

said mixture having a ratio: carbonyl functional groups belonging to a uretidinedione ring/carbonyl functional groups belonging to an isocyanurate ring + carbonyl functional groups belonging to a uretidinedione ring, at least equal to 4%;

d) from 0 to 25% by mass, relative to the mass of the components a), b), c), d) and e), of compounds bearing at least one isocyanate functional group that are different than a), b) and c); and

e) from 0 to 10% by mass, relative to the mass of the components a), b), c), d) and e), of impurities;

said polyisocyanate composition having a functionality of greater than 3,
wherein the mass ratio $[c)(i) + c)(iii)]/b$ is greater than 2.

7. (Previously Presented) The polyisocyanate composition as claimed in claim 1, wherein the amount of compounds c)(ii) is less than 30% by weight relative to the total amount of compounds categorized in c).

8. (Previously Presented) The polyisocyanate composition as claimed in claim 1, wherein the component d) represents not more than 10% by mass relative to the total mass of the components $a) + b) + c) + d) + e)$.

9. (Previously Presented) The polyisocyanate composition as claimed in claim 1, wherein the component e) represents from 0.05% to 10% by mass relative to the total mass of the components a) + b) + c) + d) + e).

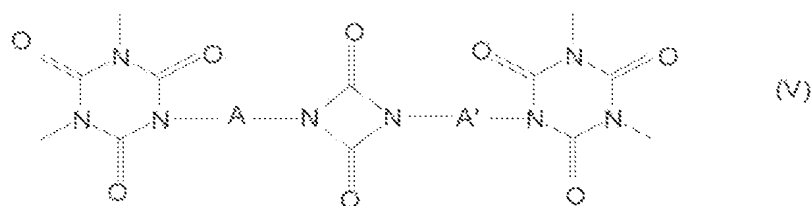
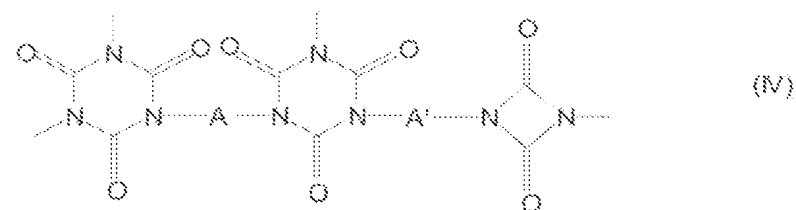
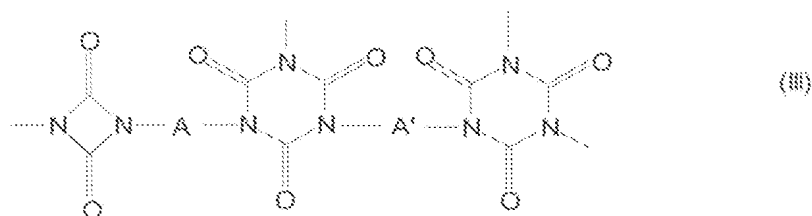
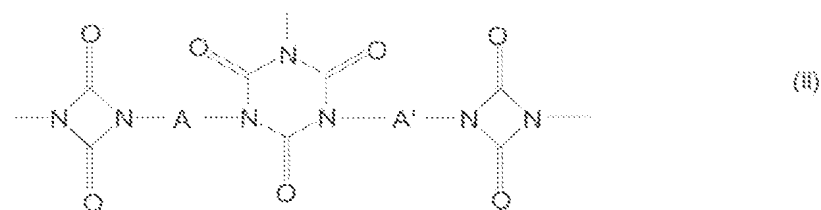
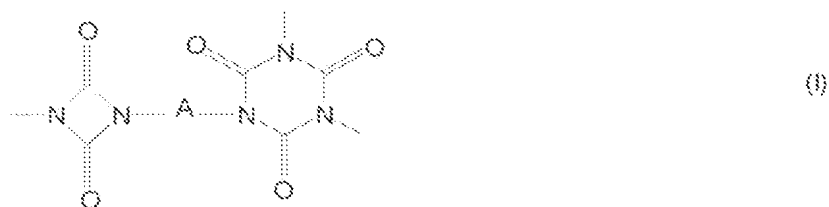
10. (Previously Presented) The polyisocyanate composition as claimed in claim 1, wherein the component e) consists of residues formed from polycondensation catalyst and/or of byproducts from the polycondensation of the starting isocyanate monomers and/or of solvent(s).

11. (Previously Presented) The polyisocyanate composition as claimed in claim 1, wherein the component d) comprises said residual isocyanate monomer(s).

12. (Previously Presented) The polyisocyanate composition as claimed in claim 11, wherein said isocyanate monomer(s) represent(s) from 0.05% to 20% by mass of the mass of the components a) + b) + c) + d) + e).

13. (Previously Presented) The composition as claimed in claim 1, further comprising an amount of not more than 200% by mass of a) + b) + c) + d) + e), of an organic solvent or mixture of organic solvents that is liquid at ambient temperature, which does not comprise an isocyanate functional group, which does not comprise a functional group capable of reacting with the isocyanate functional group, which has a boiling point of not more than 200°C and which is miscible with the components a), b), c), d) and e).

14. (Previously Presented) The composition as claimed in claim 1,
 wherein the compounds comprising at least one uretidinedione ring and at least one
 isocyanurate ring comprise a group selected from formulae (I) to (V) below, and
 mixtures thereof:



in which A and A', which are identical or different, represent the residues of an isocyanate monomer compound after removal of two isocyanate functional groups.

15. (Currently Amended) The composition as claimed in claim 1, comprising from 1% to 100%[[,]] of the NCO groups present in the composition masked using a masking agent.

16. (Previously Presented) The composition as claimed in claim 15, wherein the masking agent is a monofunctional masking agent selected from the group consisting of hydroxylamine derivatives, oximes, phenol derivatives, amide derivatives, malonates, keto esters, hydroxamates and nitrogenous heterocyclic compounds.

17. (Previously Presented) The composition as claimed in claim 16, wherein the masking agent is methyl ethyl ketoxime or methyl pyruvate oxime.

18. (Currently Amended) The composition as claimed in claim 15, wherein the masking agent is selected from the group consisting of pyrrolyl, 2H-pyrrolyl, imidazolyl, pyrimidinyl, pyridazinyl, pyrazinyl, pyrimidinyl, pyridazinyl, indoliziny, isoindolyl, indolyl, indolyl, indozolyl, purinyl, quinoliziny, isoquinolyl, pyrazolidinyl, imidazolidinyl and triazolyl groups.

19. (Previously Presented) A process for preparing the polyisocyanate composition as claimed in claim 1, comprising the following steps:

i) preparing a starting reaction medium comprising the starting isocyanate monomer(s) and optionally other monomers that react with the isocyanate functional group;

ii) reacting the starting reaction medium in the presence of a dimerization catalyst, optionally by heating the reaction medium to a temperature of at least 40°C;

iii) reacting the reaction product from step ii), comprising unreacted monomers, with a (cyclo)trimerization catalyst under (cyclo)trimerization conditions;

iv) removing the unreacted starting monomers from the reaction product from step iii); and

v) optionally reacting the reaction medium with a masking agent before, during or after steps i) to iv);

process step iii) being carried out until a degree of conversion of isocyanate monomers present in the starting reaction medium of at least 35% is achieved.

20. (Previously Presented) A process for preparing the polyisocyanate composition as claimed in claim 1, comprising the following steps:

i) preparing a starting reaction medium comprising the starting isocyanate monomer(s) and optionally other monomers that react with the isocyanate functional group;

ii) reacting the starting monomers with a (cyclo)trimerization catalyst under (cyclo)trimerization conditions;

iii) reacting the reaction medium of step ii) in the presence of a dimerization catalyst, optionally by heating the reaction medium to a temperature of at least 40°C;

iv) removing the unreacted starting monomers from the reaction product from step iii); and

v) optionally reacting the reaction medium with a masking agent before, during or after steps i) to iv);

process step iii) being carried out until a degree of conversion of isocyanate monomers present in the starting reaction medium of at least 35% is achieved.

21. (Previously Presented) The process as claimed in claim 19, wherein the dimerization catalyst is selected from the group consisting of tris(N,N-dialkyl)phosphotriamides, N,N-dialkylaminopyridines and trialkylphosphines.

22. (Previously Presented) The process as claimed in claim 19, wherein the dimerization catalyst is a trialkylphosphine.

23. (Previously Presented) The process as claimed in claim 19, wherein the trimerization catalyst is a trialkylphosphine.

24. (Previously Presented) The composition as claimed in claim 1, for preparing a coating, further comprising, for successive or simultaneous addition, a coreactant comprising reactive hydrogen.

25. (Previously Presented) A method for preparing a paint or other coating comprising incorporating therein a composition as claimed in claim 1.

26. (Previously Presented) A process for preparing polymers, comprising the following steps:

- bringing the polyisocyanate composition as defined in claim 1 into contact with a coreactant that comprises derivatives containing reactive hydrogens; and
- heating the reaction medium thus formed to a temperature that allows crosslinking of the components.

27. (Previously Presented) The polyisocyanate composition as claimed in claim 1, wherein the molar ratio of (a)/(b) is between 0.2 and 1.8.

28. (Previously Presented) The polyisocyanate composition as claimed in claim 27, wherein the molar ratio of (a)/(b) is less than or equal to 1.6.

29. (Currently Amended) ~~The A polyisocyanate composition as claimed in claim 2,~~ with a high mean functionality, obtained by polycondensation of diisocyanate or triisocyanate monomers, comprising:

(a) from 0.5% to 30% by mass, relative to the total mass of the components a), b) and c), of compounds bearing a single uretidinedione functional group having a molecular mass of not more than twice the average molecular mass of the isocyanate monomers having the highest molecular mass;

(b) from 0.5% to 45% by mass, relative to the total mass of the components a), b) and c), of compounds bearing a single isocyanurate functional group with a molecular mass of not more than three times the average molecular mass of said isocyanate monomers having the highest molecular mass;

the molar ratio of (a)/(b) being between 0.02 and 2,

(c) at least 40% by mass, relative to the total mass of the components a), b)
and c), of a mixture of polyisocyanate compounds having a molecular mass at least
equal to three times the average molecular mass of the isocyanate monomers
having the smallest molecular mass and bearing at least two isocyanate functional
groups, and
said mixture comprising

(i) compounds bearing at least two isocyanurate functional groups, excluding
those comprising uretidinedione functions,

(ii) compounds bearing at least two uretidinedione functional groups,
excluding those comprising isocyanurate functions and for which the number of
monomer units is less than 5,

(iii) compounds bearing at least one isocyanurate functional group and at
least one uretidinedione functional group, having a molecular mass greater than
three times the highest molecular mass of the above isocyanate monomer
compounds;

said mixture having a ratio: carbonyl functional groups belonging to a uretidinedione
ring/carbonyl functional groups belonging to an isocyanurate ring + carbonyl
functional groups belonging to a uretidinedione ring, at least equal to 4%;

d) from 0 to 25% by mass, relative to the mass of the components a), b), c), d)
and e), of compounds bearing at least one isocyanate functional group that are
different than a), b) and c); and

e) from 0 to 10% by mass, relative to the mass of the components a), b), c), d)
and e), of impurities;

said polyisocyanate composition having a functionality of greater than 4.

30. (Previously Presented) The polyisocyanate composition as claimed in claim 5, wherein the component c) represents at least 50% by mass relative to the total mass of the components a) + b) + c).

31. (Previously Presented) The polyisocyanate composition as claimed in claim 6, wherein the mass ratio $[c)(i) + c)(iii)]/b$ is greater than 3.

32. (Previously Presented) The polyisocyanate composition as claimed in claim 31, wherein the mass ratio $[c)(i) + c)(iii)]/b$ is greater than 4.

33. (Previously Presented) The polyisocyanate composition as claimed in claim 7, wherein the amount of compounds c)(ii) is less than 20% by weight relative to the total amount of compounds categorized in c).

34. (Previously Presented) The polyisocyanate composition as claimed in claim 33, wherein the amount of compounds c)(ii) is less than 15% by weight relative to the total amount of compounds categorized in c).

35. (Previously Presented) The polyisocyanate composition as claimed in claim 9, wherein the component e) represents from 0.1% to 8% by mass relative to the total mass of the components a) + b) + c) + d) + e).

36. (Previously Presented) The polyisocyanate composition as claimed in claim 35, wherein the component e) represents not more than 5% by mass relative to the total mass of the components a) + b) + c) + d) + e).

37. (Previously Presented) The polyisocyanate composition as claimed in claim 12, wherein said isocyanate monomer(s) represent(s) from 0.1% to 10% by mass of the mass of the components a) + b) + c) + d) + e).

38. (Previously Presented) The polyisocyanate composition as claimed in claim 37, wherein said isocyanate monomer(s) represent(s) not more than 2% by mass of the mass of the components a) + b) + c) + d) + e).

39. (Previously Presented) The polyisocyanate composition as claimed in claim 38, wherein said isocyanate monomer(s) represent(s) not more than 1% by mass of the mass of the components a) + b) + c) + d) + e).

40. (Previously Presented) The composition as claimed in claim 13, further comprising an amount of not more than 100% by mass of a) + b) + c) + d) + e), of an organic solvent or mixture of organic solvents as defined in claim 13.

41. (Previously Presented) The composition as claimed in claim 13, further comprising an amount of not more than 50% of an organic solvent or mixture of organic solvents as defined in claim 13.

42. (Previously Presented) The composition as claimed in claim 15, comprising from 10% to 100% of the NCO groups present in the composition masked using a masking agent.

43. (Currently Amended) The process as claimed in claim 19, wherein process step (iii) is carried out until a degree of conversion of isocyanate monomers present in the starting reaction medium of at least ~~[[35%]]~~ 40% is achieved.

44. (Previously Presented) The process as claimed in claim 20, wherein process step (iii) is carried out until a degree of conversion of isocyanate monomer present in the starting reaction medium of at least 40% is achieved.